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ABSTRACT

The effectiveness of a prescriptive teaching program on the reading, arithmetic, and linguistic development of 35 institutionalized mentally retarded children (mean age 12 years) was investigated. A prescriptive, precision teaching approach was used, along with positive reinforcement in the curriculum areas of reading, mathematical computations, and linguistic development. Analysis of the data from pre- and posttests of the Wide Range Achievement Test and the Illinois Test of Psycholinguistic Abilities indicated significant gains in all three areas. (Author/CL)

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AN INDIVIDUALIZED PRESCRIPTIVE TEACHING PROGRAMME FOR INSTITUTIONALIZED RETARDED CHILDREN

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Abstract: The purpose of the study was to evaluate an experimental prescriptive teaching programme and its effectiveness in enhancing reading, arithmetic and linguistic developmental skills of institutionalized children in a large state training centre for the mentally retarded. Thirty-five children participated in the experimental prescriptive teaching project. The educational procedure was a prescriptive, precision teaching approach using positive reinforcement. Teaching emphasized three curriculum areas: reading, mathematical computations and linguistic development. A teacher and teacher's aide were primarily responsible for teaching the child in the classroom setting. The classroom teacher provided technical assistance and a teaching model. Analysis of the data yielded significant gains ($P < .01$) in reading, mathematical concepts and linguistic developmental skills.

In contemporary state institutional systems for the mentally retarded, one can identify a large group of children participating in special class programmes who are characterized by a lack of motivation and educational goals, to the extent that they are performing sub-standardly in their school performance (MARC, 1974; Mills, 1972; LeBanks, 1973; PARC, 1972; Lau v. Nichols, 1974; Serna v Portales, 1972). Subnormal intelligence is not necessarily the principal factor affecting their learning. On the contrary, it is the non-school-related factors or components of the institutional environment which have adversely affected the children's achievements (Niye, 1969; Smith, 1971).

The primary objective in initiating the project was to extend principles of instruction which could promote advancements in the management of educational problems presented by institutionalized retarded children. A second major objective was to develop replicable procedures which could be used by other teachers in the training centre. The prescriptive teaching task analysis approach attend to the above objectives and has been advocated by a number of researchers (Bijou, 1970; Cohen, 1969; Gold, 1968).

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The current study attempted to investigate the effectiveness of the individualized prescriptive teaching programme (PT) for institutionalized mentally retarded subjects based on a task analysis approach as contrasted with ability training instruction in the traditional special educational programme.[1]

METHOD

Instruments for Measuring Academic Achievement

Each subject was administered the comprehensive battery of psychological tests (SIT, WRAT and ITPA). On the basis of research and theory in the area of educational instruction, the tests selected were those which measured academic and language abilities of the process of learning. The tests were administered to each subject in the order discussed below.

Slosson Intelligence Test for Children and Adults (Slosson, 1974). Assesses an estimation of the subject's level of intellectual functioning.

Wide Range Achievement Test (Jastak and Jastak, 1965). Measures samples of reading and arithmetic computation skills.

Illinois Test of Psycholinguistic Abilities (Paraskevopoulos and Kirk, 1969). Measures the receptive and expressive processes (vocal and motor). The test also measures sequencing ability, memory and automatic process.

Subjects

The total sample was composed of 35 mentally retarded children who were randomly selected from the training centre's primary and intermediate school population. Both groups were equally divided by sex. Sixteen subjects were assigned at random to the PT group and the remaining 19 subjects were assigned to the control group (Traditional).

The PT group had a mean IQ (SIT) of 34.0, with a standard deviation (SD) of 15.1 and a mean chronological age (CA) of 11.5 years with a SD of 8.6. The Traditional (control) group had a mean IQ (SIT) of 37.0, with a SD of 15.6, and a mean CA of 12.0 years with a SD of 9.4.

Virtually all of the children showed evidence, in varying combinations and degrees, of severe retardation in language development, arithmetic computation and reading skills.

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[1]Is an approach in which individual ability (process) strengths and weaknesses are identified in order to prescribe remediation for the abilities themselves.

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Academic achievement was measured on a pre-post treatment basis with the Wide Range Achievement Test (WRAT) and the Illinois Test of Psycholinguistic Abilities (ITPA).

Special Education Programme

The two types of special educational programmes instituted in this experimental study were: the PT procedures that were adapted from those described in various reports (Bijou, 1970; Cohen, 1969; Mann, 1971; Gold, 1968), and (2) the traditional special educational programme, which advocated ability training approach (Kirk, McCarthy and Kirk, 1968; Frostig, 1967; McCarthy, 1972).

The prescriptive teaching approach was used in this study as an individualized task analysis approach. This approach advocated assessment of academic skill development and instruction tailored to move the subject from where he is to where we desired him to be. The emphasis was on component skills and their integration into complex instructional objectives (skills).

Procedures

The programme was carried out in a spacious, well-equipped classroom during normal class hours, five days a week. The classroom staff consisted of a teacher and a teacher's aide who spent approximately three to five hours with each child per week. The subjects in the experimental group were given the PT programme, while the second group (control) received the traditional programme in the training centre school.

The WRAT and ITPA were re-administered approximately eight months later to the two groups. Each subject was individually tested in a room in the school.

The experimental group was composed of subjects who attended three or more courses and/or activities each day. However, for 45 minutes each day the PT group composing the experimental subjects received individualized instructions tailored to move the subject from his current level of skill development to the next skill to be mastered, and the behavioral components of that next skill. If the subject achieved an acceptable approximation of the behavior (Skinner, 1953), reinforcement (M&M's) was immediately provided.

Each day before implementing an instructional procedure, the teacher prepared an average of three to four prescriptions and any materials needed to carry out these tasks. A record of each subject's behavioral performance for each session was maintained by the teacher evaluating each prescribed task daily by recording baseline and post-baseline data (Hall, 1971). This record provided important information, including (1) the instructional objectives for that task, (2) the specifics of the teaching prescription employed, (3) an on-going evaluation of the subject's performance on the task, and (4) the reinforcers used.

These daily record activity sheets provided the teachers and teacher's aide with weekly assessments of the subject's achievement on instructional objectives and pointed out when a new objective or procedure was needed. As the programme progressed, the teacher re-evaluated and modified the subject's objectives or procedures according to the results of the weekly activity sheets.

Analysis of Data

Single classification analysis of covariance model was employed to compare the performance of the PT group with the control group on reading, arithmetic and linguistic developmental skills by covarying the influence of the first testing.

Results

A comparison of the PT and traditional groups achievement was made by evaluating the pre- and post-test results gained from the WRAT and ITPA. These data were analyzed by analysis of covariance procedure. Table 1 contains the results compared on a classroom basis yielded a pre-post adjusted post mean for each subject area. The difference between the pre-post mean for each group gave the mean growth in each subject area. The pre-and post-tests for the 1974-1975 school year were administered eight months apart, so if a month's academic growth had been made for each month in a class, that class's mean score would be .80. Analysis of WRAT scores shows that the PT group made a gain of 1.66 (16.6 months--2 months for every month in class) in reading and 1.81 (18.1 months--2.2 months for every month in class) gain in math. During this same period, the control (traditional) group was making gains of 0.3 (3.0 months) in reading and .19 (1.9 months) gain in math.

In addition to the score differences achieved on the WRAT, a second indication of academic improvement made by the PT group was on the ITPA. Analysis of the total ITPA scores shows that the PT group made a gain of 244 (2.4 years--3 months gain for each month in class) in linguistic developmental skills, while the control (traditional) group was making gains of 0.57 (0.5 months) in linguistic development.

Table 2 shows analysis of covariance results for the ITPA adjusted post-test means showed a significant between-group differences for auditory reception ($F=25.12$, $df=1/34$, $P < .01$), visual reception ($F=16.28$, $df=1/34$, $P < .01$), auditory associatio- ($F=12.40$, $df=1/34$, $P < .01$), visual perception ($F=13.65$, $df=1/34$, $P < .01$), and verbal expression ($F=8.10$, $df=1/34$, $P < .01$) subtests.

Table 3 contains the analysis of covariance which was performed on the WRAT and ITPA (linguistical age equivalent) adjusted post-test means of the two groups (PT and traditional). This yielded a significant F ratio for reading ($F=13.55$, $df=1/34$, $P < .01$), a significant F ratio for math ($F=15.82$, $df=1/34$, $P < .01$), and a significant F ratio for total linguistic development ($F=17.43$, $df=1/34$, $P < .01$) was obtained.

The above figures suggest a significant difference between the PT and control (traditional) groups in reading, arithmetic and linguistic

developmental skills, with the PT group earning the higher achievement scores. Both groups showed improvement on pre-testing and post-testing on all criterion variables. The mean values reveals that the PT group earned significantly higher achievement scores than the control (traditional) group.

Conclusions and Implications

The findings of this investigation suggest several things. First, institutionalized mentally retarded children can use the prescribed prescriptive teaching procedures to enhance their academic performance and linguistic development. The success of this programme implies that future training centre school special programmes for the mentally retarded need not concentrate on ability training approaches for continuous long-term enhancement of their subject's academic achievement and linguistic development.

Second, the use of in-service training sessions provided the teacher and the teacher's aide with skills to identify behavior objectives, numerous innovative educational programmes, and an on-going evaluation of the subject's learning.

Third, the training centre's use of the presecriptive teaching task analysis approach most effectively enhanced these subjects' mean gains on reading, arithmetic skills and language development. Therefore, this study tends to confirm those findings of Bijou (1970), Cohen (1969) and Gold (1968) which demonstrated that academic skills can be taught without ability remediation.

TABLE 1

Mean Pre-test, Post-test and Adjusted Post-test Wide Range Achievement and Illinois Test of Psycholinguistic Abilities Total Scores for Each Treatment Group

Group	Sub-tests Reading	Arithmetic
Prescriptive Teaching		
Pre-	3.1	4.2
Post-	19.7	22.3
Adjusted Post-	19.4	23.7
Traditional		
Pre-	4.2	5.1
Post-	4.5	7.1
Adjusted Post-	4.9	5.5
	ITPA PLA*	
Prescriptive Teaching		
Pre-	2.98	
Post-	4.42	
Adjusted Post	6.01	
Traditional (Control)		
Pre-	3.17	
Post-	3.74	
Adjusted Post-	3.04	

*Is the psycholinguistic age equivalent to the chronological age of those individuals within the normative group who perform at the same level.

TABLE 2

Mean Pre-test, Post-test and Adjusted Post-test Illinois Test of Psycholinguistic Abilities Sub-test Linguistic Age Scores for Each Treatment Gro

Group	Sub-tests Auditory Reception	Visual Reception	Visual Association	Auditory Association	Verba Expre
Prescriptive Teaching					
Pre-	2.58	3.20	2.69	3.27	3.35
Post-	5.29	5.67	5.23	5.52	5.45
Adjusted Post-	6.09	6.28	5.65	6.11	5.88
Traditional (Control)					
Pre-	3.53	3.73	3.29	3.53	3.61
Post-	3.73	4.11	3.60	4.18	4.12
Adjusted Post-	2.78	3.38	3.11	3.47	3.61

TABLE 3

Summary of Single Classification Analysis of Covariance for Achievement Differences Between Prescriptive Teaching and Traditional Groups Controlling for Prior Test Achievement I.Q., Reading, Arithmetic and Linguistic Developmental Skills

Source of Variation	df	MS	Reading Skills F	Arithmetic Skills F	Development Linguisti Skills F
Between Subjects	1	743.80	13.66**		
Within Subjects	33	54.45			
Between Subjects	1	1170.11		15.82**	
Within Subjects	33	73.95			
Within Subjects	33	17780.05			
Between Subjects	1	309956.56			17.43**
TOTAL	34				

**P<.01, F=13.66, df=1/33.
**P<.01, F=15.82, df=1/33.
**P<.01, F=17.43, df=1/33.

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